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SAFETY AND DEVELOPMENT OF COMMERCIAL AVIATION IN LATIN AMERICA, AND RELATED SUBJECTS

DECEMBER 17, 1941.—Committed to the Committee of the Whole House on the state of the Union and ordered to be printed

Mr. NICHOLS, chairman of the Select Committee to Investigate Air Accidents, submitted the following

REPORT

[Pursuant to H. Res. 125]

SECTION 1

Following a series of disastrous air crashes in the United States, which resulted in death or injury to a great number of persons, the House of Representatives, on March 3, 1941, by the passage of House Resolution 125, created the Select Committee of the House of Representatives to Investigate Air Accidents.

Section 2 of said resolution reads as follows:

> It shall be the duty of the committee to make a full and complete investigation of air crashes and other accidents in the United States in 1940 and 1941, occurring on commercial air lines, with the view to ascertaining all pertinent facts relating to the construction of flying and ground equipment and facilities, the management and operation of such air lines, the laws and regulations, and the administration of laws and regulations, relating to operation and inspection of airplanes and safety equipment and devices, the liability of such air lines on account of loss of life or injury to persons or property, and any other matters which such committee may deem it necessary to investigate, for the purpose of obtaining information to enable it to recommend action.

The committee has heretofore determined that the scope of the resolution embraced the operations of every air line based in the United States or its possessions, and under the control and jurisdiction of any agency of the United States Government.

Pursuant to said resolution, the committee has made a thorough investigation of every serious commercial aircraft accident occurring in the United States and its possessions during 1940 and 1941, with but one exception. In addition, the committee has conferred with,

nd taken testimony from, experts in every phase of aviation. The ollowing are some of the subjects considered by the committee:

(1) The adequacy of existing aids to commercial aviation, including ir-traffic control, weather services, radio ranges, lighting facilities, adio telephones, blind-landing devices, control-tower operations, and irport facilities.

(2) The characteristics and adequacy of existing airplanes.

(3) The present needs of air carriers for new and improved equipnent.

(4) The kind and character of airplanes which are now in the process f manufacture or in the blueprint stage.

In addition, the committee has carefully studied the qualifications nd background of every pilot and copilot employed by air carriers perating under United States' franchise. All of this effort has been xpended to make it possible for the committee to obtain facts as a asis for the recommendations of suitable legislation, Federal regulaions, and company operations procedure which will insure greater afety in air travel and the continued growth of commercial aviation.

The committee presently has under consideration the liability of ir lines, as directed by the resolution. It has yet to make thorough nvestigation of our weather reporting and weather forecasting services y the United States Weather Bureau to the end that it can propose hanges, if it deems them necessary, in regulations affecting this ervice, and possibly the introduction of legislation. It has yet to tudy and conduct investigation into the Civil Aeronautics Adminisration. It has yet to complete its investigation of the use of ultraigh-frequency radio as a possible further aid to air navigation.

Having carried on this work in the United States, the committee's ttention was directed to South America, since it was discovered that Jnited States' and United States' affiliate air lines in 1940 flew 30,700 oute miles, which was 46.2 percent of all of the route miles flown in South America, and, further, that those lines flew 8,737,000 air-miles, n 1940, which was 57.2 percent of all the miles flown in South America y all companies. Since the committee was charged by the resolution with the responsibility of making recommendations which would nsure, if possible, the safe and healthy growth of commercial aviation n the United States, the committee on its South American investigaion was primarily concerned with two things: One, the safety and the comparative safety of air travel on the American-owned and -operated lines running through the Latin American countries; and, two, the possibilities of South and Central America as an outlet for our air commerce. Incidentally, the committee was interested to determine what detrimental effect, if any, the operation of foreign commercial air lines in Latin America was having on our hemispheric and national defense.

If it might be thought by some that the committee, in interesting itself in the operation of German and Italian commercial air lines in South America, was getting outside of the scope of authority conveyed upon it by the resolution, one needs but to peruse the information herein contained to determine that it was the duty of the committee while in South America to do anything possible to promote the safety of United States citizens or, as a matter of fact, the safety of any American citizen, traveling by air on commercial lines in and through Latin-American countries.

At the meetings of the American foreign ministers, held first in Panama in 1939, and then at Habana in 1940, at which 21 republics were represented, the following actions were taken:

In Panama at the 1939 meeting the following resolution was unanimously adopted:

> To recommend to the governments represented therein that they take the necessary measures to eradicate from the Americas the spread of doctrines that tend to place in jeopardy the common inter-American domestic ideal.

At the Havana meeting in 1940 they not only reaffirmed the principle contained in the above resolution but recommended that legislation be adopted to prohibit foreign political activities by any group—no matter what forms they use to disguise or cloak such activities.

Latin America

Latin America stretches from the Rio Grande southward to the Antarctic. Its total area of more than 8,000,000 square miles is roughly 2½ times the size of the United States; but its population of 123,000,000, approximately 26,000,000 of whom are white (15,000,000 to 18,000,000 are Negroes, another 15,000,000 to 18,000,000 pure Indian, and the remainder mestizos), is a little less than our own, and only one-quarter of the population of Europe. About three-quarters of the Latin-American people live in South America, somewhat more than half the balance being in Mexico, with the remainder about equally divided between the West Indies and Central America. The convenient term "Latin America" should not mislead one into the belief that the area is a uniform political or economic unit. It is comprised of 20 independent republics, widely divergent in size, composition of population, social structure, type of government, and degree of economic development. Each country must be considered individually, and any generalizations must be carefully qualified when applied to individual cases.

However, despite these divergences, there are certain basic features of Latin-American geography and economics which have contributed to the rapid and early growth of air transportation in almost all countries. In this respect, conditions in South America are typical of those throughout Latin America. That continent has the smallest total population and lowest density per square mile of any continent except Australia. The population is distributed around the margins of the land mass and the few major hubs of dense settlements. Rio de Janeiro, Buenos Aires, Santiago, and Lima are separated by great distances.

The continent is primarily dependent on agriculture and mining, and is comparatively young in the scale of economic development. High mountain ranges and great areas of jungle are serious physical obstacles to the construction of highways and railroads. As a result, the ground-transportation system is inadequate and fragmentary in the extreme. Only three areas, centering in Rio de Janeiro, Buenos Aires, and Santiago, possess rail networks even remotely comparable to those of Europe and the United States, and there are few rail systems connecting two or more countries. A large part of the continent depends on river steamers, cart roads, and mule trails. In the interior the Amazon River and tributaries constitute the only ground transportation system for an area two-thirds the size of the

United States. In Central America, Mexico, and the West Indies the same general conditions prevail. Mountain barriers abound and surface transportation is, to say the least, unsatisfactory. Central America is heavily dependent on river boats and mules for transportation, and while northern Mexico has a relatively extensive railroad system, the southern part of that country is inadequately supplied with railways or highways. The importance of the airplane in transportation is evident from the fact that there are nearly as many miles of air lines in Latin America as there are miles of railroads. In only 6 of the 20 republics does railroad mileage exceed air-line mileage. All the Central American countries and 2 of the South American countries have more air line mileage per square mile of area than has the United States.

In the course of this investigation the committee traveled through 16 countries and covered approximately 21,000 miles.

Purpose of This Investigation

The basic function of the committee is to investigate air disasters, air safety, and related fields, and to recommend to the Congress, to the appropriate Government agencies, and air carriers such legislation, regulation, and changes in flight technique as may be conducive to safer air travel.

For 6 months or more, while in the course of investigating air accidents, the committee has journeyed to every section of continental United States, investigating the competency of airplanes, the competency of flight personnel, the adequacy of weather observation, weather forecasting, and weather reporting, the adequacy of navigational aids, and the adequacy of airports and landing facilities. The committee has progressively released reports upon the serious accidents which have occurred, and will continue to release reports until the investigation is complete. Several legislative recommendations have already been made, and others are to follow. These will deal with lighting, with improved landing fields, with air-space control, and many other factors which enter into the whole perspective of air safety.

An increasing number of people are now daily flying the commercial airways of the United States, but the volume of air traffic is but a small fraction of what it will be in the near future, when the military imperatives are at an end and time and effort, without restriction, can be devoted to the further development of air commerce. Truly, this industry will grow to untold proportions.

The committee has, within the last few months, closely observed the growth of air commerce in the United States. It has observed the steadily increasing load factor, and has watched with some dismay the growing danger that flows out of taxing the full capacity of the commercial air lines of our own country. The committee is fully sensible of the fact that day after day on all domestic air lines there is crowding, and that cancelations of flight reservations are quite common because space is not available. The following table is evidence of this fact:

Air-carrier operations statistics for the periods January–June 1941 and 1940
Domestic

	January–June 1941	January–June 1940	Percen of increa over 19
Revenue-miles flown	61, 689, 346	49, 021, 661	25
Revenue passengers carried	1, 569, 608	1, 151, 458	36.
Revenue passenger-miles flown	587, 197, 446	453, 455, 729	29.
Express carried (pounds)	7, 804, 508	5, 204, 610	49.
Express pound-miles flown	4, 310, 824, 619	2, 948, 425, 961	46.
Available passenger seat-miles flown	1, 058, 706, 678	776, 594, 069	36.

The committee, moreover, is not insensible of the fact that for mar years the domestic air lines of the country, while going through pioneering and development stage to make air travel safe and certai have been on the lean side of the ledger. The committee is not i sensible of the fact that much of the present crowding of domestic a lines and much of the necessity for refusal to carry passengers has bee caused (1) by the increased number of people employed in nation defense activities who have found it necessary to use the air lines as mode of quick transportation and who hold certain priorities on spac over the ordinary business or pleasure passenger, and (2) by reaso of the fact that priorities on equipment, necessary to the military an naval imperatives, have made it impossible for air lines to secu sufficient equipment to take care of the increased passenger an express demands.

The obvious answer to the problem of a growing load factor an of a growing demand for airplane space is that more planes be pro vided to the domestic air carriers of the United States. Through th Air Transport Association they have requested 450 or more twin motor and four-motor planes for delivery over a period of severa years to meet this growing demand. The military imperatives wit which we are confronted today has curtailed the building of com mercial transports. Inasmuch as the committee was aware of thi acute situation, it spent many days investigating the production o commercial airplanes at the Lockheed plant, the Douglas plant, an the Boeing plant. It went so far as to subpena records. It hel conferences with authoritative officials in the War Department, th Navy Department, and the Department of Commerce, in the hop that there might be a relaxing of the restrictions which are presentl imposed upon the builders of air transports, in order that additiona transports might be released to meet the growing traffic demand an that experimental work and prototype construction of new an advanced transport airplanes might continue.

The committee learned in the course of its investigation at th aircraft plants of the country that the men who give direction to thes industries are genuinely anxious to continue building transports a the present time. They have repeatedly insisted that they hav the facilities, the skilled craftsmen, and all other things necessary t continue this program without materially affecting the building o

military airplanes. The builders of commercial aircraft have, within the last year or two, discovered many new improvements in the design of airplanes which they should like to incorporate in the new transports which they propose to build and which also would improve the types of military aircraft. One of the outstanding aeronautical engineers in the country made the observation to the committee that the planes which are now in transport use will seem as flying "trucks" compared to the new planes which they propose to produce. All this, of course, is in the interest of the safety of those who fly the air lines of the country today, but it is also of extreme importance in the transport of troops.

We come, however, to another factor, as we look at the question of plane production. When the war and the demand for military planes come to an end, there will be an acute dislocation in the aircraft industry of this country, attended by the disemployment of many thousands of craftsmen. At the present time, hundreds of thousands of American workingmen are employed, not only in the aircraft factories of the country, but in additional factories which produce necessary aircraft engines, instruments and facilities. The natural question, then, arises as to whether or not this prospective dislocation can be met.

At the end of the war this Nation will probably be on a production basis of 50,000 planes per year. Other nations are continuing to build and improve aircraft. When the war ends they, too, will be at peak production and will be confronted with the problem of dislocation of manpower employed in this industry and competition will be keen.

Even a partial continuance of the manufacture of aircraft after the war is over will require a market. It is obvious that expensive airplanes for transport purposes cannot be constructed unless they can be sold and used. It is probably a fair estimate that not more than 500 replacements will be necessary from one year to the next on the domestic air lines of the United States. Where, then, shall the aircraft manufacturers look for a market for the improved planes which must be constructed at war's end if production is to be continued and manpower is to be continued in employment? It is obvious that there is but one place to seek for a market, and that is in the field of hemispheric, foreign, and transoceanic flying.

European competitors will certainly be in this market as quickly as the aircraft industry of the United States. One need but indicate that there is already operating in the South American field such lines as the Lati (Italian) line, the Condor-Lufthansa line, the former Air France line, as an indication that other nations are closely watching the hemispheric and transoceanic field of flight.

It may be said that the competitive race is already under way. Added to all this is the fact that every nation will be equipped with thousands of capable pilots, with thousands of skilled airplane mechanics, and with untold millions in investment in productive facilities. These must either be used or become an acute economic problem within the confines of the nations which have made greatest progress in the field of air transportation.

It is obvious, also, when one contemplates the conditions and the distances which prevail in the sister continent to the south, that South America will be one of the first areas in which the various nations will undertake to develop air transportation more fully. It has been a

long-neglected continent. It will become the immediate objective (the leading commercial nations of the world. And so it becomes question, now, as to who will win the skyways and the air marke of South and Central America.

One can conclude this part of the statement by saying that th United States of America, its aircraft manufacturers, and everyon identified with the air industry, are now keenly aware of the fligh possibilities in South America.

At this point one should add that the people of Latin Americ are far more air conscious than the people of the United States This is true for many reasons. As early as 1902, and antedatin the Wright brothers' first flight by a year, Santos Dumont, of Brazi after whom the airport at Rio de Janeiro is named, was carrying o work that made him the air pioneer of the Western Hemisphere He had an aptitude for flight, and was constantly experimentin in the aerodynamic field. He was an early inventor of an airplan that flew, and from that day on our cousins to the south seeme to have become air conscious.

In 1920, which is nearly a generation ago, the first successfu commercial air line in the Americas was established in the Republi of Colombia. It was known as the Scadta line. This air line wa operated by Germans, and ran from Barranquilla to Girardot, whic was the railhead for Bogota. As early as 1920 this line made th journey in approximately 7 hours, whereas the journey by surfac transportation, which includes both rail and steamship, require at least a week in the wet season when rivers were navigable an at least a month in the dry season when the journey was made b railroad and horse or motor-drawn conveyance. The committe had opportunity to fly over this route. It traverses high mountains dense jungles, and swamp. Colombia is now traversed by a network of air lines.

In 1925 another German-dominated line was initiated in the Republic of Bolivia. It operated from the city of Cochabamba to the city of Veracruz. While this was only a 200-mile run, it had to be negotiated over high mountains, which made surface travel extremely slow. The fastest surface transportation between the two above-mentioned points required 4 days, whereas it was covered by air line in 3 hours.

Two years later, in 1927, another air line was initiated by German interests. It became known as the Condor line, and operated in Brazil from Rio de Janeiro to Rio Grande do Sul via Porto Alegre on the Atlantic coast, a distance of approximatey 900 miles. This German operation in South America is of much significance, because the original Condor line became the basis and pattern for German air line operations throughout the continent of South America.

There have been other developments in the field of air transport by different interests in South America at a time when the United States was first becoming air conscious. By 1927 there were 5,700 miles of airways in South America, in comparison with 8,900 in the United States.

One might well ask why South America became air conscious so early and saw the opportunities of travel by flight. The answer lies in the fact that distances are enormous, some of the republics are of large area, and obstructions to surface travel are many.

Let us consider for a moment the country of Brazil. In geographical area it is 200,000 square miles larger than the United States, and has a population of 44,000,000. While it is larger in area than our country, it has but one-third of the population. Brazil has but one-tenth of the railroad mileage of the United States, and but one-twenty-fifth of the highway mileage. The reason highway and railroad development has not pushed forward is because of the rugged and difficult terrain. Brazil is a country where one finds vast areas of swamp, pampas, deserts, and mountains. The interior of Brazil is populated by many wild tribes. The terrain is, for great distances, very rough. In certain seasons rivers are so swollen as to become impassable. It is because of these surface obstructions that air transport developed rapidly in Brazil. The airplane can transcend and is wholly independent of all surface obstacles.

The Republic of Argentina, with an area of 1,079,965 square miles is approximately one-third the size of the continental United States. Its approximate length is 2,150 miles, and its breadth 980 miles. Its western boundary is in the crests of the cordilleras of the Andes and on the east it is bounded by the Atlantic Ocean, having a coast line of 1,600 miles. The population of Argentina is 12,762,000, of which nearly one-quarter, or approximately 3,000,000 live in the capital city of Buenos Aires and its suburbs. The famous pampas country of Argentina, the economic heart of the country, extends fanwise from Buenos Aires, a distance of 300 to 400 miles and it is devoted to cattle raising and cereals.

Argentina is traversed by the largest railroad network in South America, comprising 25,804 miles, and it is traversed also by more than one-half the entire highway mileage in South America, 253,115 miles. Established air lines operate over 5,514 route miles. The country is highly developed and is more akin to the Middle West and West of the United States than any other country in South America in its economic development and characteristics of its population.

Consider also the Republic of Chile. Its average width is probably 150 miles. And yet it has a 3,700-mile coast line. The entire length of Chile is composed of barren and forbidding mountains. But nature has compensated for the ruggedness of the terrain, for in these mountains one will find rich deposits of nitrate, copper, silver, gold, lead, and zinc. This stringbean-shaped republic, with a coast line of 3,700 miles, has less than 2 percent of the railroad mileage, and less than two-thirds of 1 percent of the highway mileage of the United States.

Similarly, one can take Venezuela, Colombia, Peru, and other countries in South America, richly endowed with wealth-bearing but rugged terrain, which makes surface transportation extremely slow, if not impossible. And so the population of this continent became highly sensible of the advantages of air transportation more than a generation ago.

There are additional reasons why they have become air conscious. One might cite, for instance, the matter of air mail. Scattered throughout South America are American, Canadian, French, and German banks, commercial houses, and commercial agents who must be in constant contact with their principal offices in other countries. If they rely upon slow steamship, it takes much time for the exchange of mail and important communications. Telephone and cable com-

munications are extremely expensive. They, therefore, have resorte to air mail, and already the poundage of air mail between North ar South America has grown to substantial proportions. For the ye 1940 the air mail between these two continents aggregated 183,0 pounds, while between the United States and Latin America as whole it aggregated 546,810 pounds. And it is continuing to gro The explanation, of course, lies in the fact that one can deliver b air mail in 48 hours what will take from 12 to 20 days to dispatch b surface transportation.

At this point, a few statistics on distances may be of interest, as a indication of the reason why air commerce between North and Sout America will grow by leaps and bounds, both for purposes of pleasu and business. From New York to Buenos Aires is approximatel 8,500 miles. To traverse this distance by surface transportatic requires 18 days. To make the journey by air now requires 87 hou in total elapsed time, which effects a saving of 14½ days. From Ne York to Lima, Peru, is approximately 4,200 miles. The journey b surface requires 12 days; by air it requires 43 hours, effecting a savir of more than 10 days. From New York to Barranquilla, in th Republic of Colombia, is approximately 2,400 miles. By surface th journey requires 4 days; by air it requires but 19 hours. It is obviou from this contrast that in the near future, when the impact of war ha relented, there will be a tremendous acceleration in the volume of a commerce of all kinds to South and Central America.

It might be well to include one additional point concerning a express, and particularly air express of an urgent nature. Already an enormous air express business is being done in medicines, serum concentrates, cut flowers, and even baby chicks. Thousands c pounds of orchids are shipped weekly from the world's orchid cente at Medellin, Colombia, to Miami, New York, and inland points c the United States. But an outstanding example of what air expres means and what its potentialities are can be inferred from an exper ence which the committee had at Guayaquil, Ecuador. The com mittee observed 100 5-gallon cans of Diesel oil stacked in the airpor at Guayaquil. On making inquiry, it learned that this Diesel o was to be carried by air express to a point near a gold mining camp i Peru. The entire value of the oil shipment was but $30. The ai express cost was $300, and the truck expense from the point of plan delivery to the mining camp was $50. It seems singular, indeed that an industrial enterprise could afford to pay $350 for the trans portation of $30 worth of Diesel oil. Yet this oil is essential to a ver profitable operation, and it is but one of many such which exist i South America today.

In view of these possibilities of annihilating space, whether peopl fly for business or for pleasure, it must be manifest that air commerc to South America holds untold possibilities. Moreover, Soutl America is a new world to millions of people in the United States, anc it is fair to assume that when plane tariffs are within reach of th average traveler and flight conditions improve, many people wil journey to South America to spend a vacation.

But what of the safety of United States citizens who will fly tc South and Central America in ever-increasing numbers in the nea future? The committee proceeds on the theory that a United State citizen who is a passenger on an air line operating from the Unitec

States to South America and who crashes in San Juan, P. R., or in the jungles of Brzail or on the mountains of Peru, is just as dead as one who may have crashed in Cincinnati, Chicago, or St. Louis. These passengers, who will fly in increasing numbers to South America, are citizens of the United States. The air lines on which they fly are based in the United States and are under the supervision of and limited control by the Civil Aeronautics Administration. They are common carriers and so regarded. They are completely registered and licensed by the United States Government. That same Government, through the appropriate agencies, has expended millions of dollars for radio ranges, for the certification of pilots, the certification of airplanes and equipment, for the installation of weather observation and reporting services, and for many other facilities, all of which are designed to improve air safety. That same Government is spending, and has expended, hundreds of millions for the purpose of developing adequate airports, which are suitably and properly lighted to make flight safe. Moreover, the common carriers are liable for the safety of their passengers. And, finally, it should be observed that today the United States Government is subsidizing transoceanic and hemispheric flight to the extent of $16,000,000 per year. To be sure, this is in large part a subsidy for the purpose of securing adequate mail transportation between the United States and other countries on this continent. All this, however, is indicative of the fact that the Federal Government, including the executive agencies, the Congress, and the committees of Congress, have a proper and genuine interest in the safety of the people who fly on hemisphere air transports between the United States and Latin America. They are the particular solicitude of this committee.

Air transport to and within South America should be carefully differentiated. One must make the distinction between international lines which fly to and across the borders of the various South American republics and the interior lines which operate exclusively within the boundaries of a given South American country. At the present time there are three international lines which operate to Latin America. The first is an Italian line which operates from Rome to Rio de Janeiro via Dakar and Natal, and thence to Buenos Aires. It was accorded a Brazilian operating permit in June 1939, and commenced operations for both mail and passenger service in December 1939. It flies a route of 5,600 miles, and uses large three-engined landplanes. The name of this line is the Linea Aeree Transcontinentale Italiane, and is popularly known as Lati. It is a subsidiary of the Italian Government owned national air line. It is flying this run at the present time.

The second international airline operating in Latin America—the Pan American Airways, Inc., is based in the United States. It operates from Miami, Fla., via several routes to South America. One route is direct, nonstop to the Canal Zone (a 6-hour flight in a stratoliner). Another route is via Cuba and Jamaica to Barranquilla, Colombia. A third route is from Miami, via Cuba and Haiti, to Maracaibo, Venezuela. A fourth route joins the Carribean Islands from Trinidad to the Yucatan Peninsula of Mexico and thence to Mexico City. A fifth route connects Trinidad and the ports of Venezuela and Barranquilla, Colombia, with Panama and thence via the capital cities of the Central American republics to Mexico City. At Mexico City connection

is made with the United States at Brownsville, Tex., and through a Mexican subsidiary with the United States at Los Angeles, Calif.

However Pan American's principal South American international line extends from Miami, Fla., via San Juan, P. R., and Port of Spain, Trinidad to Belem do Para at the mouth of the Amazon in Brazil, and thence overland direct to Rio de Janeiro and thence via Porto Alegra to Buenos Aires, Argentina.

The third international line, Pan American-Grace Airways, Inc., known as Panagra, operates from Buenos Aires north to the Canal Zone via Santiago de Chile, and thence along the Pacific slope of the Andes, with an alternate route departing at Cordoba in Argentina, thence via La Paz in Bolivia and joining the Pacific coast route at either Arica in Chile or Arequipa in Peru. In Ecuador, Panagra also operates a local loop service connecting seven of the principal cities. Panagra joins together the capital cities of Argentina, Chile, Peru, Bolivia, Ecuador, Colombia, and Panama where transfer is made with Pan American of passengers, mail, and express to and from Central American countries and the United States.

An effort is now being made to revive a fourth international air line which formerly operated between Paris, France, via Dakar in Africa and Natal or Recife in Brazil to Rio de Janeiro and Buenos Aires, and known as Air France. It went into bankruptcy when French Government subsidies were withdrawn. This company has a considerable investment in airport and navigational aids in Brazil and perhaps Argentina, and holds claim to substantial stocks of fuel, but these stocks, with those of Lufthansa, were confiscated by the Brazilian Government while the committee was in Rio de Janeiro. It is apparently believed by the Axis Powers that the services of this line might be better received in South America than those now performed by the Italian line Lati and therefore negotiations were commenced to reinstitute this line to take the place of Lati. However, at least in Brazil, these negotiations seem to have failed.

Interior lines within the boundaries of individual countries are now in most instances closely controlled by the Government of the country concerned. The Republic of Colombia is well served by a Colombian line known as Avianca. It represents a consolidation of 3 different airlines. It now operates 13 planes and serves approximately 39 cities. It is operating Boeing, Douglas, and Ford equipment, and is giving excellent service. This line was originally German-operated under the name of Scadta, and was de-Germanized in 1939.

The Republic of Peru is now internally served by the so-called Faucett Line. This company was started by a United States citizen named Elmer Faucett, who journeyed to Peru as a salesman for the Curtiss Airplane Co. in 1920. After years of genuine effort, he finally developed an airline which serves the major localities of Peru. It operates single-engined equipment exclusively, and has developed an interesting—and in fact a marvelous—safety record, as it has experienced but 1 accident in 13 years of operation.

The Germans organized the first successful air lines in South America in the early 1920's. These enterprises were primarily commercial in nature and remained so until shortly after the ascension of the National Socialist government. At that time German air-transport policy underwent a fundamental change, and German activities

in South America, while commercial in form, became largely propagandistic, and even semimilitary in intent. The large-scale expansion program was begun early in 1935, the spearhead of which has been the Brazilian-incorporated Syndicato Condor. Condor is to all intents and purposes an arm of the German-Government-owned Lufthansa, and has been liberally supplied with equipment and funds. Besides expanding the services of wholly German-owned companies, the Germans have acquired influence over a number of South American-owned lines by selling them equipment and furnishing them with technical personnel on very liberal terms. There are nine air lines (16,600 route-miles) operating in South America, which use German equipment exclusively. (Included in this category are Lloyd Aereo Boliviano, which has one United States plane, and Ariposta Argentina, which has a few obsolete French planes in storage.) Seven of these also employ various proportions of German personnel. Two of the latter, Condor, in Brazil, and Sedta, in Ecuador, totaling 8,300 route-miles, are completely German owned and managed. (A third German-owned line, the Lufthansa Peru, with 1,070 route-miles, was taken over by the Peruvian Government in April 1941.) Two others, Lloyd Aereo Boliviano, in Bolivia, and Varig, in Brazil, totaling 3,600 route-miles, though partly South American owned, were originally organized by Germans, are German managed to a large degree, and undoubtedly still have a large proportion of German ownership. The remaining three, Vasp, in Brazil; Ariposta, in Argentina; and Causa, in Uruguay, totaling 2,900 route-miles, are South American-owned companies to which the Germans sold airplanes on attractive terms, with the stipulation that German pilots and technical personnel be employed until the equipment was fully paid for. German influence is still significant in Vasp, but Ariposta and Causa have reduced their German personnel greatly in the last 2 years, and are entirely under South American management. There are no Axis controlled or influenced air lines in Central America, Mexico, or the West Indies.

In Central America, and particularly in the Republic of Honduras, air service is now afforded by the Transportes Aereos Centro Americanos, popularly known as TACA. This company was established as an individual operation in 1932 by Lowell Yerex, a citizen of New Zealand. It now operates a network of approximately 5,000 miles in and through Central America, and does an enormous express business.

The principal interior operation in South America is that known as the Condor line. It is partly German owned but Brazilian incorporated, and was first established in 1927 between Rio de Janeiro and Porto Alegre. Since that time the Condor line has developed to the point where it now operates in far-flung fashion throughout Brazil. Until recently its operations extended to Peru.

In a number of countries its operation was taken over by the local Government, so that today the bulk of the operation of the Condor line is in Brazil, although it has substantial mileage in other countries as well. At the present time, Condor makes approximately 65 stops in Brazil, and operates extensively along the entire northern border and into the interior of Brazil. Planes, for the most part, consist of one- and three-engined Junkers with several large modern Focke-Wulf airplanes. Judging from comments on the part of

officials and public, this line has evidently rendered both reasonably safe and satisfactory service. There are, however, definite evidences of over-crowding and of carelessness and disregard for safety factors in its operation. There have been many near-serious accidents.

In more recent years American capital in conjunction with local capital, or the local government, has supplanted important parts of the German air-line operations in South America. Panair do Brazil, a Brazilian company managed under the direction of Pan American Airways operates thousands of route miles in Brazil, in some cases paralleling the operations of the German Condor lines; as for example the 3,000 mile route up the Amazon River, and the route from Belem at the mouth of the Amazon, following the northern coast of Brazil to Natal and Recife and thence coastwise to Rio de Janeiro. Panair operates many other routes radiating from Rio de Janeiro and Sao Paulo to interior points.

In certain South American countries, notably Brazil, Argentina, and Peru, mail routes have been established and are being operated by the local army air forces. These routes connect interior points with the capital cities. They are probably unprofitable as commercial operations but they are valuable to the citizens of these countries and are important from the standpoint of national defense. The pilots are army officers and the airplanes used are small, single engine planes of the types commonly used by private fliers in the United States. The airports are small and necessarily rudimentary but for this service a network of radio stations is established which can be developed for purposes of national defense, including weather reporting, and the airports can be developed as traffic may require.

Following is a summary of air-line operations in South America for the year 1940, which will indicate the importance of operations on the basis of nationality of company.

Nationality	Route miles	Percentage of total	Miles flown	Percentage and total
United States and United States affiliates	30,700	46.2	8,737,000	57.2
German and German affiliates	15,800	23.7	3.173.000	20.8
South American lines	7.400	11.1	1.755,000	11.5
South American, mail only	10,400	15.8	1,210,000	8.0
Other lines	2,000	3.2	380,000	2.5
Total	66,300		15,255,000	

The safety record of lines operating to South America in the years 1936 to 1940 are rather interesting, because they represent a reasonably high safety factor. In this period the Pan American system had 8 fatal accidents where passengers were involved; the Faucett line had 1; the Avianca line had 3; the Condor line, 3; and the Vasp line, 1, as against 21 fatal accidents on the domestic air carriers of the United States. Miles flown per fatal accident as averaged over the period from 1936 to 1940, ranged from 5,836,000 in the case of Pan American, to 1,750,000 in the case of Vasp; and 2,186,000 in the case of Condor. These totals will compare with 19,101,770 miles flown per fatal accident for the domestic air lines of the United States.

In view of the fact that the committee's basic purpose in inspecting flight facilities in South America was the study of air safety and the recommendation of improvements conducive to safety on United

States operated air lines, we should like to make the following observations:

First, it must be realized that no agency of the United States Government has authority to make recommendations concerning the operation of any United States owned air line which operates wholly within the boundaries of a given South or Central American country, and which is exclusively under the jurisdiction and control of the government of such country. The committee has no jurisdiction other than that which extends to air carriers which are based in, licensed by, and regulated under the laws and regulations of the United States Government. Its recommendations, therefore, must concern themselves exclusively with those lines under our jurisdiction which operate in the international field. These recommendations are tentative in nature, and can be classified under structures, personnel, navigational aids, and airports.

It should be remembered, also, that intercourse between nations, since time immemorial, has been handled by treaty, and that certain treaty obligations enter into the whole field of international air commerce. It is manifest that any government in South America is supreme in its own domain, and can make whatever rules, regulations, or requirements it desires for the control and supervision of air commerce, irrespective of whether it be an international or a domestic line. This is of particular importance where an international air line, based in the United States, undertakes the acquisition of property for the purpose of constructing airports. Either the matter must be covered by treaty or it must be covered by contractual relation between such air carrier and the government involved. The committee is entirely sensible of this complication, and therefore holds the recommendations on the tentative side, subject to such modification as may be necessary to comport with international law.

There is room for divergence of opinion concerning the adequacy of 2-engine aircraft for operations in Central and South America, but it is the personal and direct observation of the members of this committee that American owned international air lines operating in Latin America should be equipped with 3- and 4-engine airplanes of long range and large carrying capacity. The only routes now so equipped are those which operate long distances over water, to wit: The trans-Caribbean routes including the route from Miami to Belem do Para (at the mouth of the Amazon).

The reason for this recommendation is obvious when one considers the long distances to be covered, the ruggedness or impenetrability of the terrain, the lack of adequate intermediate airports, the lack of navigational aids, the inadequacy of weather-reporting services, the high altitudes required to be reached in crossing mountain ranges, the infrequency of human habitation in the jungle and plains areas, the great difficulties attendant upon transporting and maintaining supplies of gasoline and oil at the rear alternate airports, the scarcity of competent maintenance personnel at other than terminal airports, and in addition to these physical reasons—the now great and increasing demand for both passenger and cargo space.

Description of Flight

At this point in this report the committee offers a condensed de scription of its flight as follows:

Departed Miami, Fla., at 7:30 a. m. Sunday, October 12, 1941, e route to Port of Spain, Trinidad, flying in a Boeing 307 4-engin plane (strato-liner) via San Juan, Puerto Rico, altitude 16,000 feet Arrived in San Juan at 1:45 p. m., late because of slight delay i departure and because of head winds. It was too late to proceed t Trinidad as the airport at Trinidad is not lighted and consequentl landings there cannot be made after sundown. We therefore remaine the night in San Juan.

Departed San Juan the following day at 5:30 a. m. for Belem d Para via Port of Spain, Trinidad. Entire flight over water to Trinida at 16,000 feet, thence to Belem over trackless jungle of the Guiana and Brazil. Arrived 4:20 p. m. After passing the coast line on open space in the jungle appeared possible of expansion into a alternate airport.

Belem do Para is the Amazon basin seaport, a city of 300,000 people The Amazon is navigable for ocean-going steamers 1,000 miles inlan to Manaos, a city of 80,000 population and to river steamers a additional 1,500 miles to the Peruvian city of Iquitos.

Tributaries are also navigable to river boats in all directions. Th Amazon has a fall of only 350 feet in 2,500 miles and it is several mile wide (up to 15) with many islands. Air-line operation using sea planes follows the Amazon to its upper reaches near the Ande Mountains.

Departed Belem do Para at 6:30 a. m. the following morning fo Rio de Janeiro, via Barreiras (the Barriers), distance 1,500 miles airplane used—a Douglas DC–3. Flight over jungle for first 500 miles then jungle merged into a relatively dry, badland type, highe terrain, with sparse vegetation and many deep ravines. Barreiras i the midway stop for gas and oil. It takes 6 to 8 weeks to transpor gas and oil in drums and cans to Barreiras via the San Francisc River. Last half of trip was made on instruments between an through cloud layers. Arrived Santos Dumont Airport, Rio d Janeiro at 4:20 p. m., Tuesday, October 14, 1941.

Departed Rio de Janeiro 8 a. m., Monday, October 20, for Bueno Aires, Argentina, via Porto Alegre, Brazil, in a Douglas DC–3 cruising at 7,000 feet. The first portion of the trip was over water of shore, then crossing low mountains to Porto Alegre. From Port Alegre to Buenos Aires the flight was over sparsely settled cultivate land (Uruguay), and finally over the River Plate, landing at Bueno Aires at 6 p. m. (Delayed at Porto Alegre 2 hours for engine repairs.

The following day the committee made a brief visit to Montevideo Uruguay.

Departed Buenos Aires at 10 a. m., October 24, 1941, for Santiago Chile, in a Panagra Douglas DC–3 via Cordoba and Mendoza. Th trip over the Andes through Uspallata Pass was impressive indeed Leaving Mendoza, Argentina, at 3:30 p. m., the plane entered th Mendoza River Valley, climbing to 18,000 feet at Uspallata Pass

where Mount Aconcagua, the highest mountain in the Western Hemisphere, rises to 23,098 feet on the left, then level flight for 15 minutes at 18,000 feet and down through the Juncal River Valley to Santiago. This part of the trip consumed 1 hour 20 minutes. Oxygen hoses were available for each passenger. Arrived Santiago de Chile at 4:45 p. m.

Departed Santiago de Chile for Lima, Peru, at 7 a. m. via Arica, Chile, and Arequipa, Peru, in a Douglas DC–3, cruising at about 9,000 feet. The Pacific shelf of the Andes over which this portion of the route passes is absolutely arid. Deep gorges cut by short mountain streams arising in the high Andes Mountains occur every 25 to 50 miles. Some of these gorges are said to be from 5,000 to 7,000 feet deep. The Pacific shelf is very narrow. The ocean appears on one hand and 20,000-foot mountains on the other. Population exists at occasional seaports and in the irrigated bottoms of the gorges. Elsewhere there is no sign of habitation. This arid shelf extends over 3,000 miles on the west coast of South America. We flew out to sea a few minutes as we approached Lima, let down through a local fog until visual contact was made with the ocean, and then flew in across the city to land at 5:30 p. m.

Departed Lima, Peru, at 10:40 a. m., October 29, 1941, en route to Guayaquil, Ecuador, cruising at 7,000 feet with stops at Chiclaya and Talara, Peru. At Talara the committee saw an extensive oil field from which gasoline stocks for the west coast of South America are obtained.

The arid condition persists until nearing Guayaquil, when it breaks off and becomes jungle within a few miles. Arrived 3:50 p. m.

Departed Guayaquil, Eucador, at 6 a. m. the day following (October 30) for Cali, Colombia, cruised at high altitude on instruments until nearing Cali. Arrived 9:40 a. m. Changed to Avianca, a Colombian air line operated under Pan American Airways management and with American captains (copilots are Colombians and will be promoted to take over captaincies as they become proficient). Took off for Bogotá, Colombia, at 12:15 p. m., climbed to 16,000 feet, on instruments, crossed a range of mountains and arrived Bogotá (elevation 8,600 feet) at 1:35 p. m.

Departed Bogotá for Barranquilla November 1, 1941, at 12:20 p. m. Arrived Barranquilla 2:50 p. m. Airplane used was a Boeing 247–D. We were the only passengers. Ship was loaded with express, including 300 pounds of gold in ingots and about 600 pounds of orchids destined for the United States, plus other items. Cruised at 10,000 feet over mountain range, then out over perhaps 200 miles of swamp jungle, the lower basin of the Magdalena River. Many rain storms visible but we flew between them.

At Barranquilla, Colombia, the committee rested over the week-end instead of visiting Caracas, Venezuela, as planned.

Departed Barranquilla, Colombia Monday, November 3, 1941, at 3:53 p. m. for Cristobal, C. Z., arrived at 5:55 p. m. Flight in a DC–3 of Pan American Airways which originated at Trinidad. Cruised over water at about 6,000 feet, losing sight of land for a short period en route. Crossed the isthmus on the following morning. At 2:30 p. m. one member of the committee departed for Miami via Pan American Airways in a Boeing 307 (stratoliner) arriving Miami at 8:30 p. m., cruising at about 12,000 feet. This 6-hour trip was entirely over water except while crossing above Cuba.

The rest of the committee departed Canal Zone, Wednesday, November 5, at 10 a. m., for Guatemala City, Guatemala, via the capitals of the Central American republics.

Our first stop was at David, provisional capital of Panama, population, 50,000. Departed David at 11:40 a. m. eastern standard time to arrive at San Jose at 11:45 a. m. central standard time, the capital of Costa Rica, altitude of 3,969 feet, population 65,000.

Departed San Jose at 12:08 p. m., flew through some very rough, turbulent weather and arrived at Managua, the capital of Nicaragua at 1:33 p. m. Managua was rebuilt after the earthquake of 1931, and now has a population of 80,000.

Departed Managua at 1:50 p. m., arriving at Tegucigalpa, at 2:50 p. m., the capital of Honduras, elevation of 2,300 feet, population 50,000.

Departed Tegucigalpa at 3:11 p. m. and arrived at San Salvadore at 4:08 p. m., the capital of El Salvadore, population of 102,000.

Departed San Salvadore at 4:28 p. m. for Guatemala City, capital of Guatemala, arriving at 5:18 p. m. Here was demonstrated to the committee crying necessity for weather reporting and better two-way radio connection with the ground, because while our last weather report before our arrival at Guatemala City gave us an estimated ceiling of 800 feet, when we arrived at Guatemala City the ceiling could not have been in excess of 200 feet and was closing down so rapidly that had we been 5 minutes later it would have been impossible for us to land, and we would have had to seek an alternate airport.

Thursday, November 6, we departed Guatemala City at 8 a. m., and went immediately on instruments. This was, to say the least, the most dangerous and thrilling portion of our trip, because the country around Guatemala City is very mountainous, with peaks running to an elevation of 13,000 feet. We circled in a reasonably close circle until we had obtained an altitude of 11,000 feet, at which time, because there are no radio beams to guide the flight of pilots, it was necessary for the flight crew to start the working of a problem which would take them between the mountain peaks and finally to the coast line of the ocean, where it was anticipated that the high cloud formations would break up. We broke out over the ocean at a 14,000-foot elevation. For the first hour and forty minutes of the flight out of Guatemala City we were never off instruments.

We arrived at Minatitlan, in the State of Veracruz, Mexico, at 11:15. At this time we were 3 hours and 15 minutes out of Guatemala City, although we were supposed to have made the trip from Guatemala to Mexico City in 3 hours and 45 minutes and we were still 2 hours and 15 minutes from Mexico City. We left Minatitlan at 11:30 a. m. and arrived at Mexico City at 1:40 p. m.

Monday, November 10, we departed Mexico City at 9 a. m. and arrived in Los Angeles at 6:55 p. m.

Conclusions From Flight Experience

From all this, one can draw the broad general conclusion, based upon terrain, long water hops, high altitudes, possible weather hazards, and so forth, that the ultimate development of safe flight on the international air lines from the United States to Buenos Aires, thence

across the mountains, and along the Pacific coast, requires an improved type of plane with ample motor capacity and ample passenger capacity. It has been the feeling of the committee that aircraft manufacturers who now have larger, more powerful and more capacious planes in the mock-up stage, for construction, as soon as priorities and military requirements will permit, should be authorized to proceed forthwith on the construction of these larger and more powerful planes, that they may be secured without delay for international air-line service, and for military transports.

A question arises as to whether or not economic consideration will permit the operation of larger multiple-motored planes. Obviously, the operation must prove profitable, for otherwise the line must retire from business, or the Federal Government must increase its subsidy to make up for operating losses. The committee believes, however, in view of the development of air commerce within the last several years, that this can be an economic operation with the use of larger planes.

It may be cited at this point that in September 1938, the Panagra line, operating from Buenos Aires to Santiago, Chile, and thence north to Guayquail, Ecuador, carried 494 passengers. In September 1941, only 3 years later, passenger travel indicated an increase of more than 600 percent, as 3,539 passengers were carried in the latter month. In August 1941, passage was refused to 309 prospective passengers. This does not include many who made informal application at the air-line offices in various parts of the different republics of South America, who could conceivably number twice that many. One hundred and seventy-nine of the 309 were rebooked on subsequent planes, making a net loss of 130 passengers in that particular month, with a net revenue loss of $20,151. This means a loss of nearly 10 percent of the entire Panagra revenue for that month. When one considers the certain increase in air travel which will follow more frequent schedules, and reduced fares, it is our belief that larger and therefore safer equipment will be economically justified.

FLIGHT PERSONNEL

Next in importance to the competency and type of plane which is used on international flight, one should properly consider the competency, experience, and training of flight personnel. Let it be observed at the outset that on international air lines a larger flight crew is carried than on domestic air lines. It consists of four and, in some cases, five persons. This would include the captain, copilot, the navigator, the communications or radio man, and the steward. Judging from the examination by the committee, it is fair and proper to state that the pilots and copilots now operating on the international air-carrier service from the United States through South America are men of high competency. In most cases they have seen service on domestic air lines and in other international air commerce. They are experienced pilots. The captains have been trained in the art of air and water navigation, and feel equally at home in navigating both elements. This observation, no doubt, will be borne out by the committee's records of the pilot and copilot in each case, indicating the number of hours flown and the variety of experience which they have had.

The committee believe that it is entirely proper and necessary tha a crew of at least four, and perhaps five, should be carried at all time: Manifestly, there must be a competent pilot and copilot to operate th craft. There must be a navigator, in view of the possibilities o getting off course over uncharted country, and finally, the meagernes of navigational aides and weather service make it imperative tha there be a communications man aboard the ship at all times to mair tain constant contact with ground stations, so that at no time will th flight be without full and adequate information concerning spc weather. An additional fact which enhances the importance of th communications officer on every flight is that the Morse code is s widely used between the flight and ground or vessel stations. Th constitutes a greater difficulty than if radiotelephone communicatior were in widespread use as they are on domestic lines.

It should be observed that in the matter of flight personnel th restrictions which now obtain in the laws of various South America republics with reference to the use of native pilots and native cre members does not apply to international lines.

In the case of interior air-line operation under the exclusive supe: vision and control of the several South American republics, rigid r strictions obtain. In some cases the laws provide that air-line pe: sonnel on interior operations must be 100 percent nationals. I other cases, it calls for 50 or 75 percent. By way of elaboration, can be said that in Mexico, Venezuela, Chile, Argentina, and Braz the legal requirement is that on nationally incorporated air lines th flight personnel must be 100 percent national. In the case of Per and Bolivia, the requirement is that 80 percent of the employees mu: be nationals. In the case of Ecuador, the requirement is 50 percen However, in view of the fact that an operation from the United Stat to South America is international in character, United States n: tionals can be employed on those lines. It should be said, howeve that the Latin-American pilots are of a very high order, and for th most part make excellent pilots.

Curiously enough these restrictions as to nationality of personn on local interior air lines were instigated in certain cases by th Germans. It must be remembered that Germans and Italia maintain their German and Italian citizenship under the laws their home countries, even though they may become naturaliz citizens of another country. This is termed "dual citizenship Therefore, in an attempt to exclude the citizens of other countrie such as the United States, from obtaining positions as air line pilo and crew on local operations in certain South American countrie they encouraged the adoption of local laws providing that air li personnel should be citizens of these countries.

Such laws permitted Germans and Italians holding dual citizensh to be employed, and excluded citizens of the United States and oth countries. In the case of Brazil, that Government soon recogniz the facts and proceeded to amend their laws to require that su personnel be Brazilian by birth. Of course, such a law does n prevent second-generation Germans and Italians from holding the positions, and in many cases this type of person is more pro-A than the native-born Axis citizen.

By these and other means, the Axis Powers have sought to domina the Latin American air-line picture, while their pilots were given bro